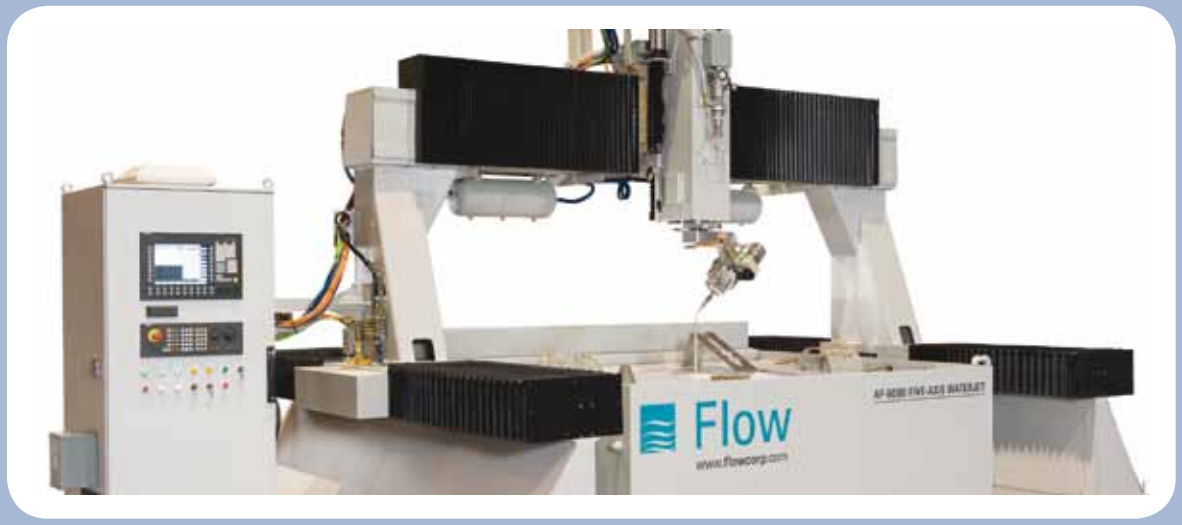

WATER JET CUTTING OF AEROSPACE COMPOSITE PARTS

French company Rex Composites recently introduced new water jet cutting technology for trimming composite parts for its customers from the aerospace industry. The company relies on the offline programming solution FASTTRIM to efficiently generate programs for a FLOW water jet cutting machine. In combination with FASTTRIM, the new technology has proven itself as a highly flexible and efficient production solution.

Molding of composite parts, bonding of structural aircraft components, manufacturing of composite sub-assemblies and components for airframes as well as sheet-metal work – these are among the services that Rex Composites provides to its aerospace clients, e.g. Eurocopter, Dassault aviation, as well as for others sectors such as auto racing with Peugeot, Citroen and Venturi. The French company offers comprehensive design and manufacturing services for complex aerospace parts and develops products such as complex fairings for helicopters and modular fuselage concepts for UAVs. The company holds Qualifas Level A certification and is a member of the Groupement des Industries Francaises Aeronautiques et Spatiales (GIFAS).

Most composite parts must be subjected to a trimming process. Formerly, Rex Composites ran their trimming operations on four milling machines for routing, but this milling technology reached its limits when tasked with cutting honeycomb patterns and rubber materials. Furthermore, composite trimming with routers is dusty and noisy, meaning high wear on the cutting tools and poor workplace conditions for the company's employees. For this reason, Rex Composites went in search of an alternative technology for trimming complex composite materials. The solution turned out to be the new water jet cutting technology, realized via a FLOW AF machine tool.

> **"I see FASTTRIM as an important component in achieving all the benefits of our 3D-guided water jet cutting technology."**
>
> **Cedric Arnaud,**
> **IT Technology Leader**

Since most parts processed by Rex Composites come from the aerospace industry, the design parts are usually provided in the industry standard format: CATIA V5. „The question of how to offline-program composite parts for water jet cutting had a very short answer: FASTTRIM. Firstly, this system is CATIA V5-integrated, meaning that we have no data conversion problems. Secondly, FASTTRIM offers dedicated customizations for water jet cutting", says Mr. Cedric Arnaud, IT Technology Leader, in explaining the decision for FASTTRIM.

The programming process begins with a FASTTRIM template that provides ideal starting conditions and a complete machine model of the FLOW AF machine tool. The native CATIA V5 CAD design data of a composite part is loaded and positioned within the FASTTRIM and CATIA V5 environment. Based on the part geometry, contours for the trimming paths can be defined

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quickly. A wide range of functionalities, e.g. intelligent contour search as well as jog and interpolation functions for modifying tool orientation, support the users in generating smooth, collision-free tool paths. „We can now resolve all potential collisions and optimize machine motions to achieve spot-on water jet cutting results. Furthermore, we can alter transitions paths and the machining sequence, which yields much faster programming", says Mr. Arnaud.

At any time, all defined tool paths can be edited or deleted. Start and end position of the tool path as well as approach and retract movements are likewise modifiable. Additionally, technical events can be placed along the tool path to directly influence and control the cutting process. Another FASTTRIM highlight is the integrated simulation. This ensures correct and collision-free programs and avoids dangerous and expensive head collisions. Due to fully collision-tested programs, Rex Composites can progress from design straight to production. „FASTTRIM has sustainably improved our efficiency in the field of water jet cutting", says Mr. Arnaud.

Within a very short time period, FASTTRIM's integrated water jet competence and the capability of preparing NC programs fully offline have enabled Rex Composites to productively apply the new FLOW AF machine to a wide range of composite parts. The FASTTRIM integration with the FLOW AF machine tool was prepared and completed in close cooperation between FLOW and CENIT. During this process, Rex Composite could rest secure in the knowledge that CENIT would deliver a turn-key solution for this new field as well.

The decision in favor of CATIA V5-integrated offline-programming has given Rex Composites a significant efficiency boost. The water jet- adapted FASTTRIM solution enabled a combination of speedy technology introduction and sustained efficiency.

► PROFILE CENIT AG

CENIT AG has been a consultancy and software specialist for the optimization of business processes in Product Lifecycle Management, Enterprise Information Management, Application Management Services and Business Optimization & Analytics since 1988. CENIT currently has over 720 employees world-wide and its customers include Allianz, BMW, Daimler, EADS Airbus, LBS, Metro, AXA and VW. A large number of customers are medium-sized enterprises, particularly in the financial services, automotive and mechanical engineering sectors, such as Dürr, ISE and Emil Bucher.

CENIT is headquartered in Germany (Stuttgart), where it is present in all the major cities. It also has a branch near Detroit to cater for the American market. CENIT is also represented in Switzerland and since 2006 in Romania. With the foundation of another subsidiary in Toulouse CENIT stresses its reputation in the aerospace industry. The internationality of CENIT's business gains more importance with a further consistent expansion of these subsidiaries.

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